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November 5, 1992

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA MESSENGER

Ms. Donna Searcy
Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Re: Ex Parte Presentation
ET Docket 92-100 (Narrowband PCS)

Dear Ms. Searcy:

On November 5, 1992, counsel for PageMart, Inc., Jeffrey Blumenfeld, Glenn Manishin, and Charon Harris, met with James L. Gattuso of the Commission's Office of Plans and Policy in connection with the captioned rulemaking docket. Pursuant to Section 1.1206 of the Commission's Rules, two copies of the written materials presented at this meeting are attached.

Sincerely,

Glenn B. Manishin

GBM:jlr
Enclosure
cc (w/out encl.): James L. Gattuso

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List A B C D E

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NARROWBAND PCS

Advanced Messaging Services

@ 900 MHz

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900 MHz Allocation Objectives

Channelization plan needed to:

- Emphasize spectrum efficiency
- Accommodate different types of services
- Provide maximum "effective" competition within allocated spectrum
- Minimize delay in service initiation to general public

Spectrum Efficiency Considerations

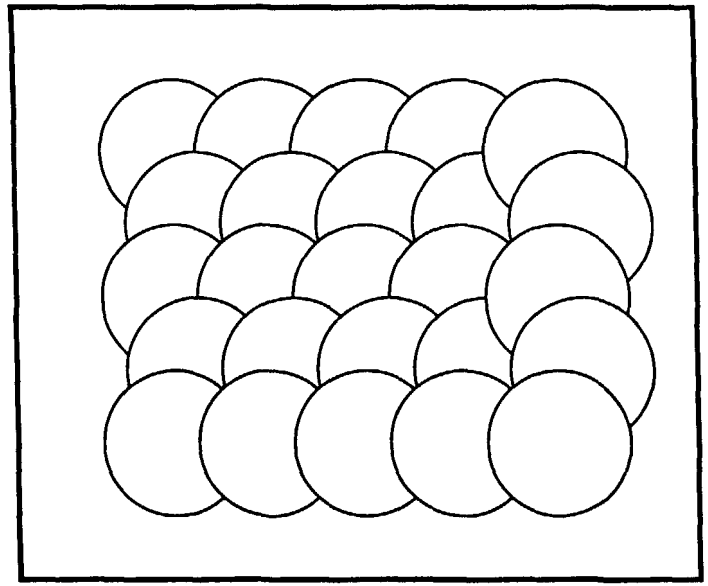
Spectrum Efficiency = Function of $\frac{\text{Bits (Delivered)}}{\text{(1) Frequency Domain (Hertz); (2) Time Domain (Sec.); (3) Space Domain (Sq. Mile)}}$

Therefore for a given bandwidth the key drivers are:

- Data Rate
- Frequency Reuse

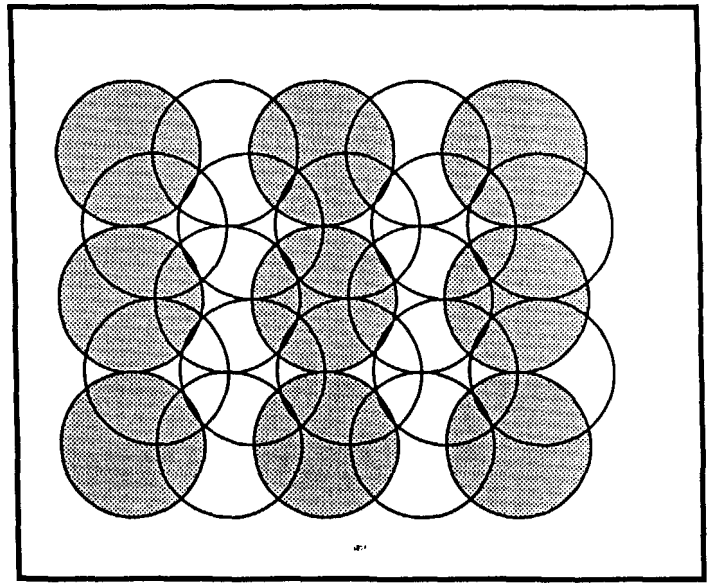
"Free Space" Throughput Improvement with Frequency Reuse Approach

Simulcast System



$$TIF^* = \frac{36}{36} = 1$$

Frequency Reuse System



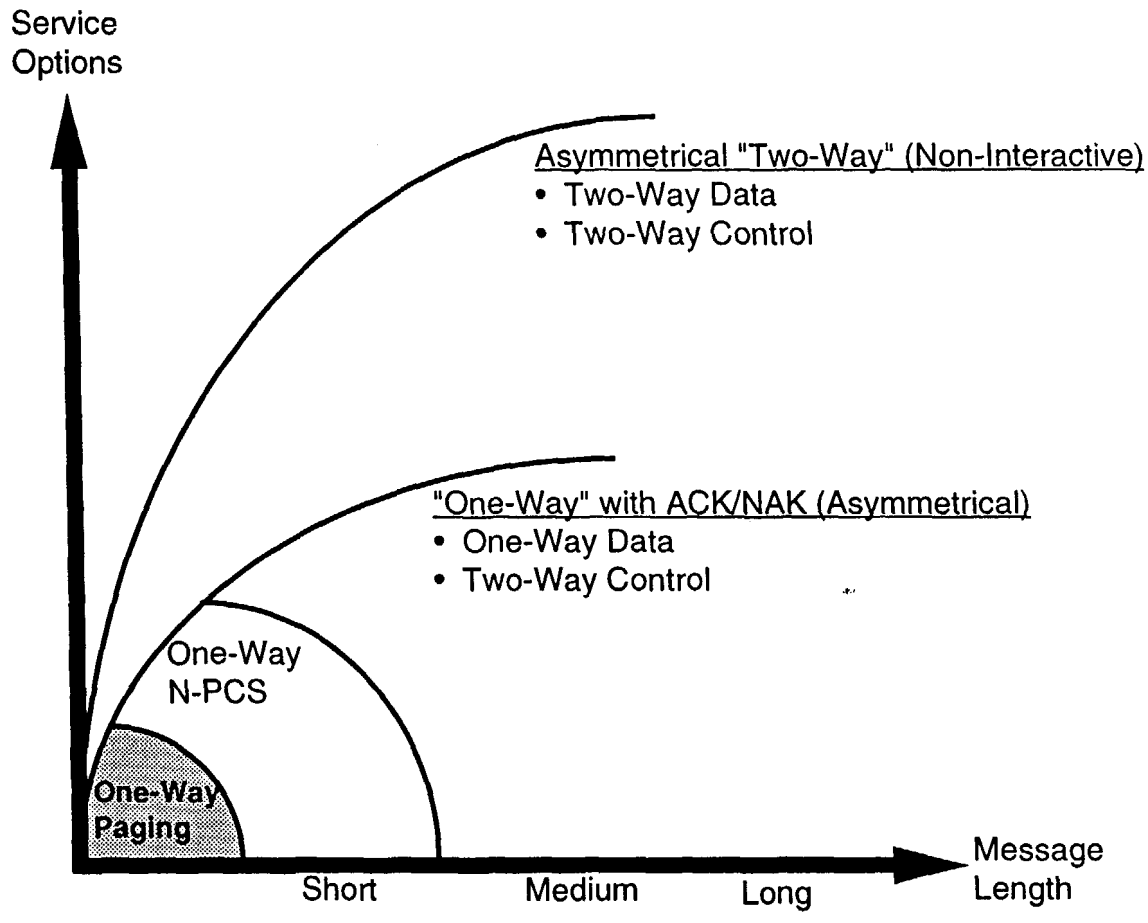
$$TIF^* = \frac{36}{4} = 9$$

$$^*\text{Throughput Improvement Factor (TIF)} = \frac{\text{(Number of Cells)}}{\text{(Reuse Factor)}}$$

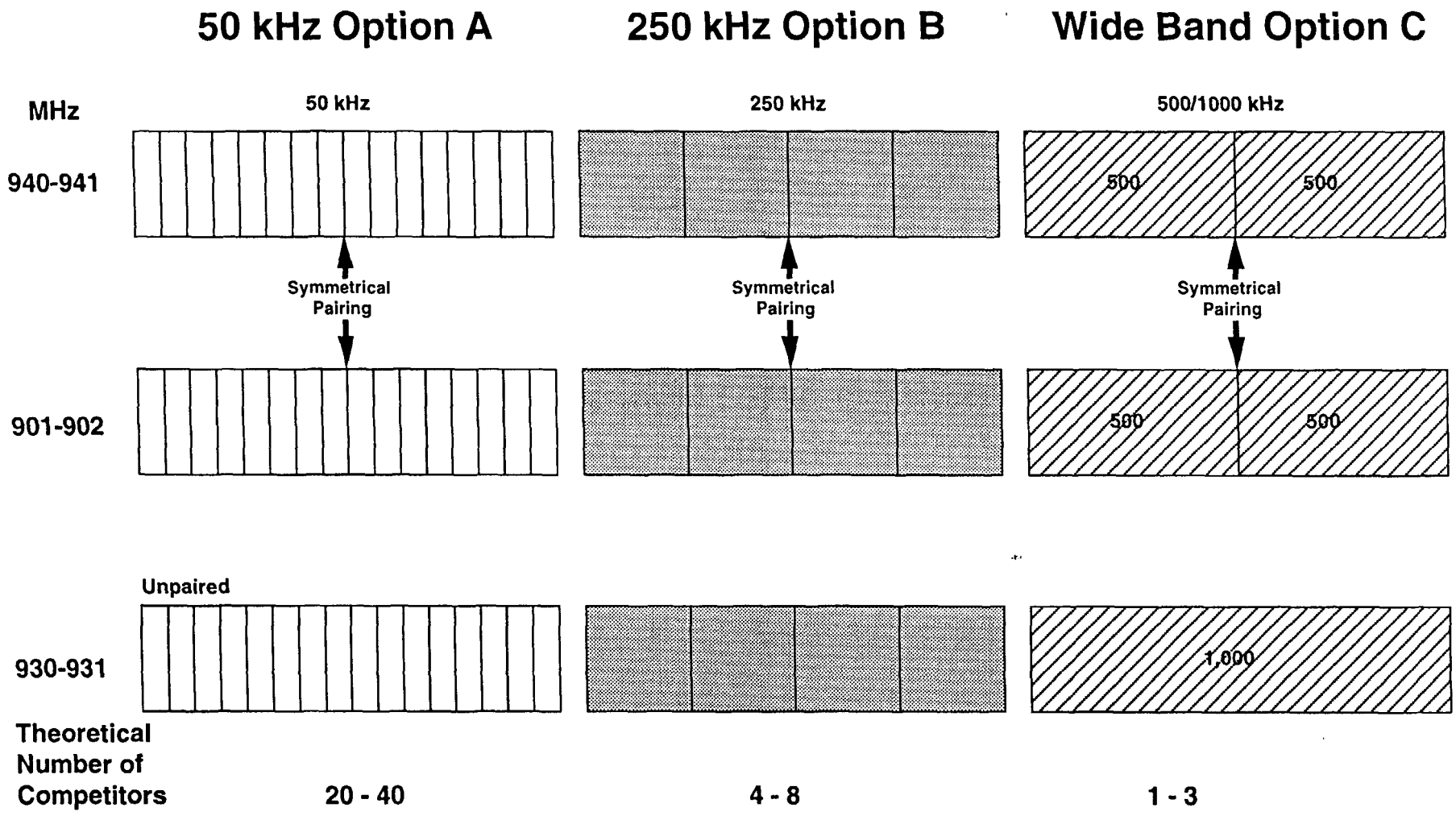
Two-Way Control Expands Applications and System Performance

- **Two-way control required for long messages...**
  - Ensures error-free transmission
  - Avoids air-time usage when "out-of-range"
- **Two-way control required for location and status...**
  - Location: Permits frequency reuse and single transmitter data transmission
  - Status: Allows subscriber to control information flow to unit

Asymmetrical Messaging Provides Most Service Options



FCC Proposed 900 MHz Allocation Options

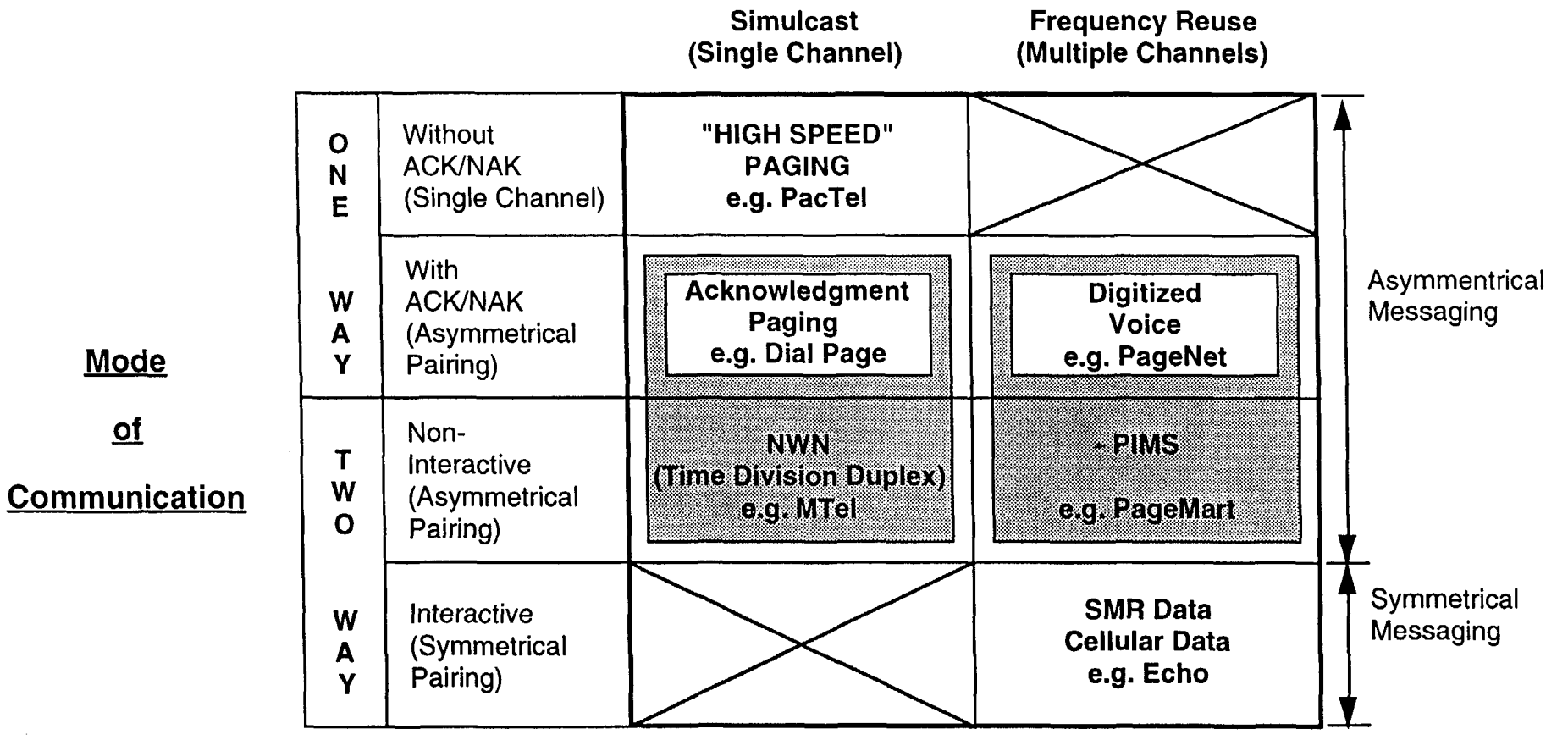


Narrowband PCS

Network Architecture Impact on Channelization

(Pioneer Preference Applicant Examples)

Data Transmission Approach



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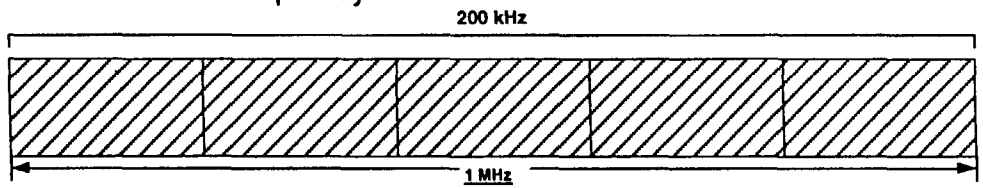
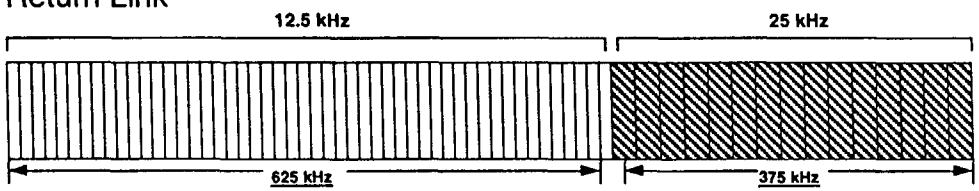
900 MHz Band Plan Structures Based on Pioneer Preference Applicants

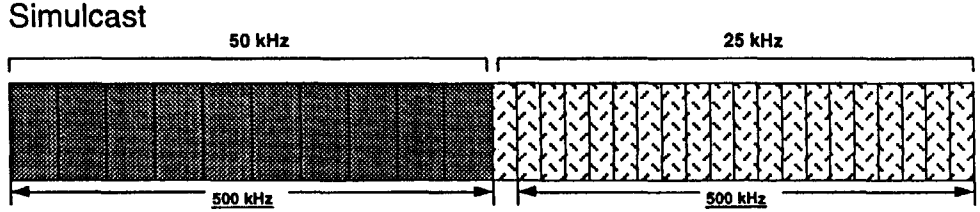
Multichannel - Frequency Reuse



Return Link



Simulcast



940 - 941 MHz

5 - 200 kHz data channels for multichannel messaging systems, with two-way capability, to be paired with one 25 kHz polling channel in 930 - 931 MHz band and one 25 kHz return link channel in 901 - 902 MHz band for a total of 250 kHz per licensee.

901 - 902 MHz

10 - 12.5 kHz return link channels for acknowledgment paging .40 - 12.5 kHz channels for acknowledgment paging when paired to conventional paging channels in 931 or 929 MHz bands.

5 - 25 kHz return link channels to be paired with one-way paging channels for acknowledgment paging/messaging. 5 - 25 kHz channels for symmetrical two-way messaging (including narrowband two-way). 5 - 25 kHz channels for multichannel messaging systems.

930 - 931 MHz

10 - 50 kHz channels. 5 for Time Division Duplex Applications including MTel and 5 for one-way high speed messaging. 20 - 25 kHz channels for acknowledgment paging, symmetrical two-way and multichannel messaging systems.

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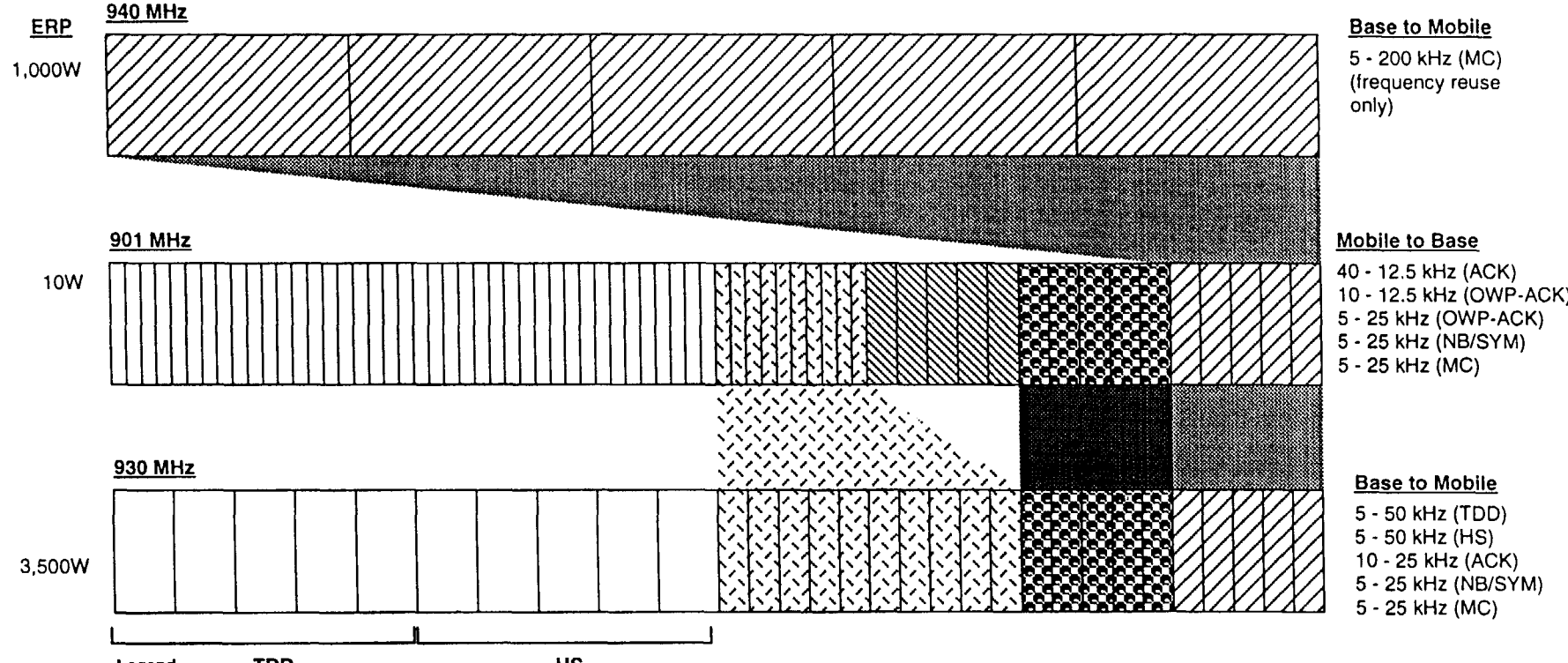
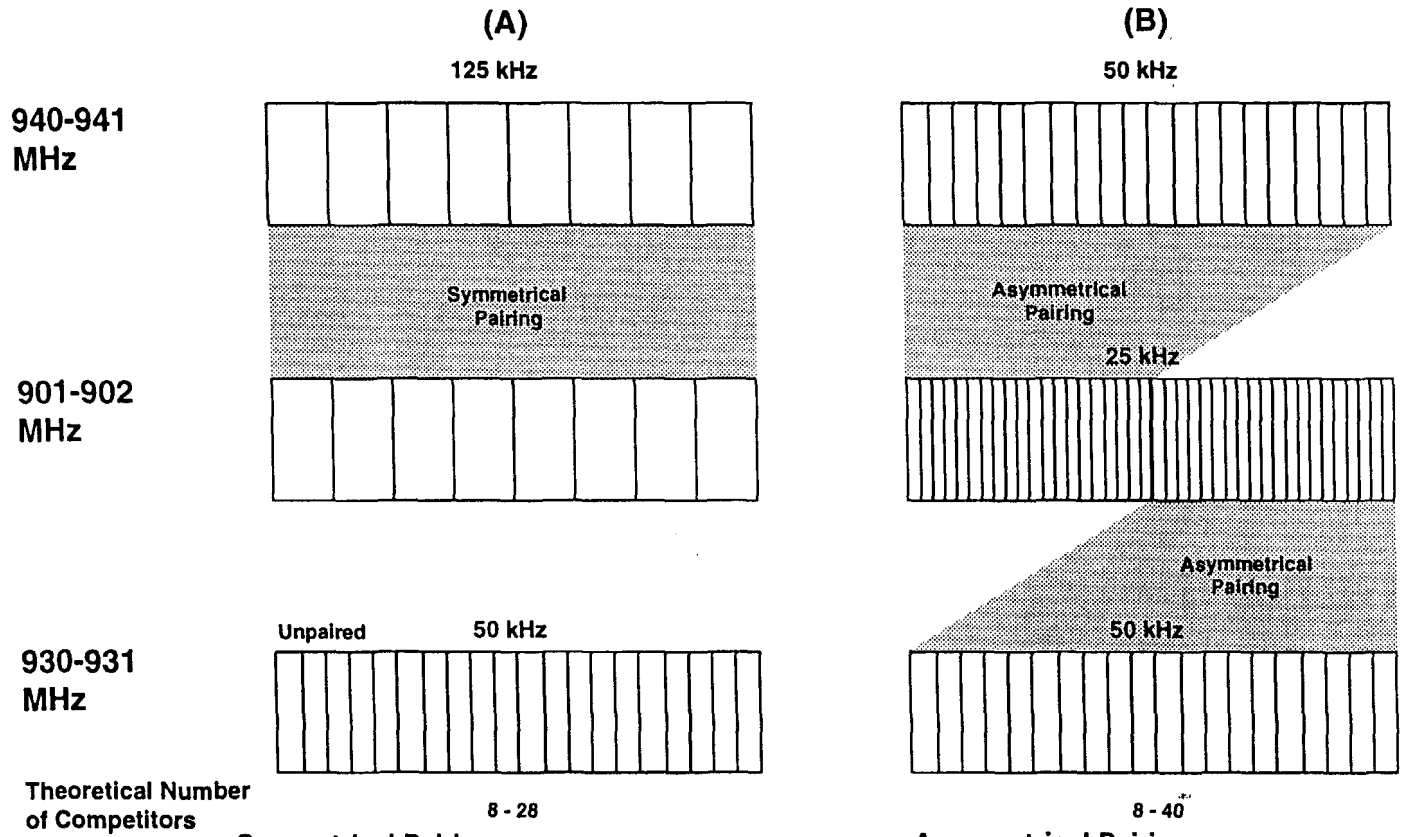
900 MHz Band Plan Structures Based on Pioneer Preference Applicants (Cont.)



Legend

- ACK - Acknowledgment Paging
- MC - Multichannel
- NB/SYM - Narrowband (25 kHz divided into 5 - 5 kHz channels) and/or symmetrical two-way
- TDD - Time Division Duplex (e.g., MTel)
- HS - High Speed Coding (one-way)
- OWP-ACK - Acknowledgment link for existing one-way paging

Alternative 900 MHz Band Plan Structures



Symmetrical Pairing

(A) Interactive Two-Way:
- 5 channel SMR-like system

(B) Non-Interactive Two-Way:
- 1-25 kHz forward link & 4-25 kHz data channels
- 1-25 kHz return link & 4-25 kHz data channels

(C) Separate loading requirements established for single versus multiple channel systems.

Asymmetrical Pairing

(A) Single Channel: 50 kHz forward link and 25 kHz return link

(B) Multiple Channels with frequency reuse: 2-25 kHz control channels and 4 to 8 - 25 kHz data channels (i.e. 3 to 5 - 50 kHz channels). **Only way aggregation is permitted is in conjunction with multiple channels, frequency reuse systems.**

(C) Separate loading requirements established for single versus multiple channel systems.

Impact of Plan (B) Channelization on Licensed Service Areas & Business Viability

	Potential Number of Competitors	Potential Number of Licensees	
Nationwide	8 to 40	8 to 40	Critical Mass for Business
Regional			
3 Zones	8 to 40	24 to 120	Increased Licensee Participation
5 Zones	8 to 40	40 to 200	
7 Zones	8 to 40	56 to 280	

Minimize Delay of Service to Public

(1) Create sufficient spectrum "abundance" by limiting channelization variations

- Few categories of different channel bandwidths
- A "homogenous building block" approach for single or multiple channel systems (i.e. Plan (B))
- A single geographical coverage area for all licensees

(2) Discourage the "post card" applicants with relatively high license application fees

(3) Stipulate "use it or lose it" construction requirements

- FCC determines t = o for construction timeframe by category (e.g. simulcast versus frequency reuse technologies)
- Firm financial showing required 90 days after t = o
- Two years to construct 35 percent of total regional or nationwide system after t = o (assuming 70% coverage of top 50 MSAs)

Conclusions

- **Messaging is primarily a "forward/link" communication process.**
  Therefore...

  ... Asymmetrical channelization allocating more channels for the forward link (or bi-directional channels) is essential for spectrum efficiency

  ... Symmetrical channel allocation is (1) less spectrum efficient and (2) unnecessary, given that 50 to 100 MHz is already allocated and available to either data only or voice/data system (i.e. Mobitex, Ardis, Cellular and SMR data)

- **Low cost of service is the ultimate competitive advantage.**
  Therefore...

  ... Multichannel, frequency reuse approaches are essential for future service viability and a channelization plan is needed to support such approaches

- **Minimizing the channelization variations while maximizing geographical coverage areas creates maximum sustainable competition and allows future technology evolution.**
  Therefore...

  ... Asymmetrical channel pairing (e.g. 50 kHz and 25 kHz) with potential for aggregation allows the "market to decide" services offered

  ... Alternative Plan (B) permits channel pairing on a TDM basis for conversion from a single channel system to a multiple channel system